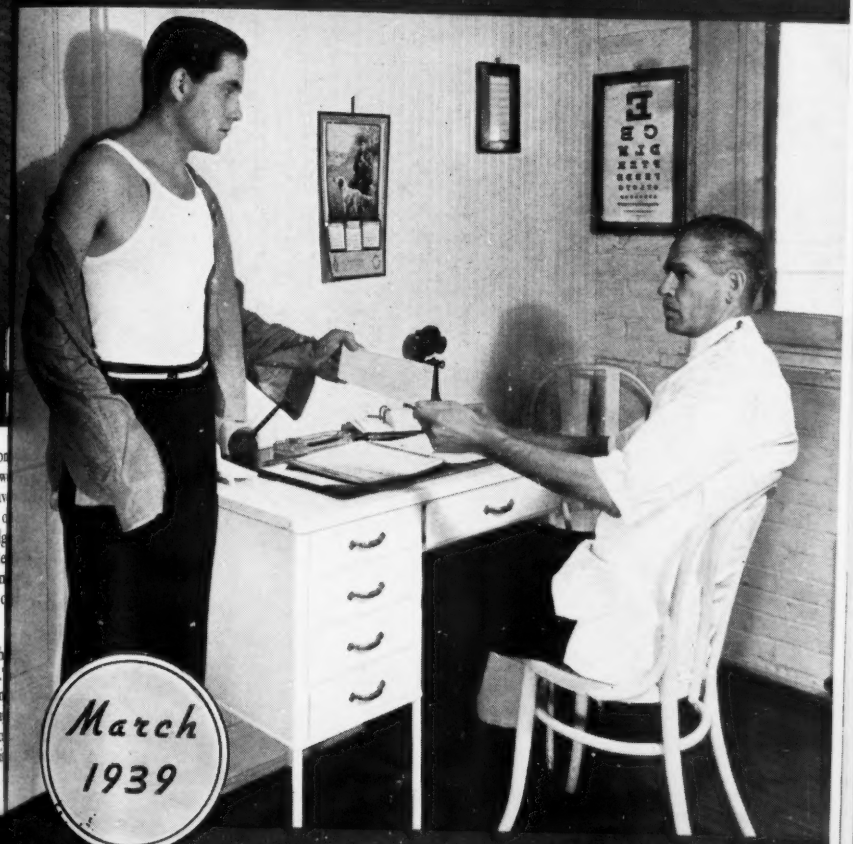
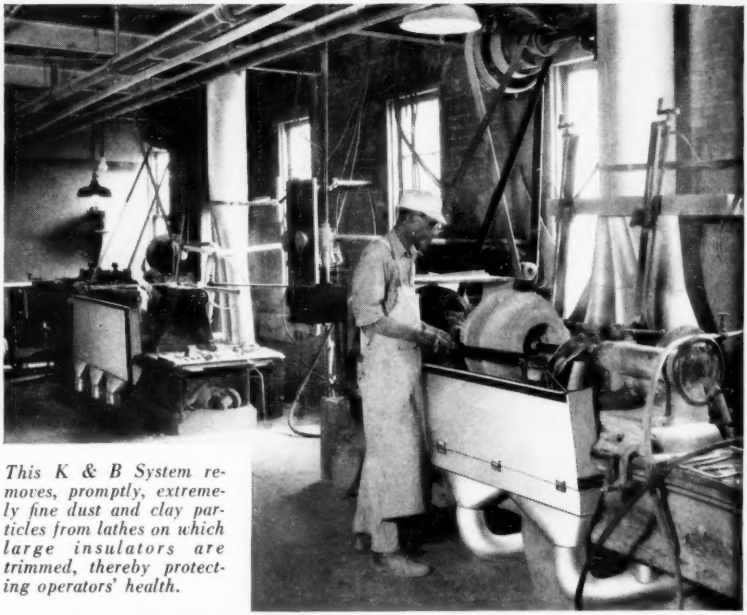
# Occupational HAZARDS & SAFETY



March 1939

There's Profit in Prevention



*This K & B System removes, promptly, extremely fine dust and clay particles from lathes on which large insulators are trimmed, thereby protecting operators' health.*

Book of interesting, valuable data mailed on request. Write today!

# *Better* DUST CONTROL

**Protects workmen against occupational hazards and diseases.**

**Provides a clean plant—improves working conditions and morale.**

**Increases production; insures a better product.**

**Reduces repairs and maintenance on machines, bearings and motors.**

**Saves on insurance rates.**

KIRK & BLUM Dust Collecting Systems—designed, engineered and erected to meet the specific requirements of each installation—assure these advantages with utmost efficiency and economy of operation. They soon pay for themselves.

**THE KIRK & BLUM MFG. COMPANY**

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**KIRK & BLUM**
**Dust Collecting Systems**

# PREVENTION IS WISER THAN CURE

A Chinaman does not pay his family physician to take care of him when he is sick or injured. Instead, he gives him a regular salary when he is in good health so that the physician will keep him well. In this country, alert operators insure their workers against injury and diseases through a well-organized safety program which includes personal protective devices.

## When Considering Personal Protection Specify WILLSON

*There's no substitute for quality.* For protection against Dangerous Dusts and Eye Injuries, you can rely on the Willson Quality Line of Respirators and Goggles. Willson No. 750 Approved Respirator for *Type A Dusts* and No. 750L Approved for *Lead Dusts* are widely used and officially approved by the U. S. Bureau of Mines. Willson Style RR50 Goggles are ruggedly built for a long-life of service and hard punishment.

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*Style RR50 Goggle. Brown Composition Cups. Clear SUPER-TOUGH Lenses.*

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PRODUCTS INCORPORATED
READING, PA., U.S.A. Established 1870
INDUSTRIAL SAFETY EQUIPMENT ASSOCIATION
GOGGLES
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Turning
RED FIGURES
into
BLACK
with
SLY DUST FILTERS

★ It's the unchecked small losses that mount into red figures—the lowered efficiency of men and the relentless wear on machinery by dust.

Yet, dust can be easily and inexpensively controlled with Sly Filters as hundreds of installations testify.

Sly pioneered this field, perfected the flat cloth bag filter which today offers greatest filtering capacity per unit of valuable space, and unmatched filter mechanism.

Ask for Bulletin 0-93. It shows how many companies have saved money with Sly dust control.

THE W. W. SLY MANUFACTURING CO.
Dust Control Equipment for Every Industrial Purpose
4751 Train Avenue Cleveland, Ohio
Branch Offices In Principal Cities

### Special Issue Next Month

The April issue of OCCUPATIONAL HAZARDS & SAFETY will be devoted to "Good Housekeeping" problems—plant cleanliness, dust control, sanitation, cleaning methods, guards, lighting, paint and other aspects of maintaining plant cleanliness for health and safety. There will be a wealth of timely and valuable information for every plant in this issue.

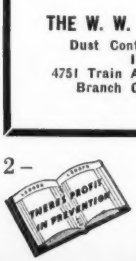
### Safety Shoes Needed

The Goodyear Tire & Rubber Co., reports that 18% of the lost time accidents in its Akron plant last year (up to November 20) were foot injuries. It was found that of the 36 foot injuries, 22 could have been prevented had the victim been wearing safety shoes. In seven other cases the wearing of safety shoes would have reduced the amount of damage. The average lost time on the 36 cases was 33 days per injury, and in only three cases did the injured employee lose less than a week's time.

### Enforcing Silica Dust Code

The New York State Industrial Commissioner has authorized a new procedure designed to expedite enforcement of the code for the control of silica dust in rock drilling. Contractors will be given 10 days to comply with the first order to provide and use dust control equipment. If the contractor fails to comply and continues to disregard the order, the labor department will take a sample of dust at drilling operations, will prohibit the further use of the drills involved, identifying them with a red tag, and will begin prosecution.





### West Virginia Sets Record

The West Virginia Department of Mines is bringing pressure for discipline and more well-trained foremen. Both officials and employees are cooperating in this and the accident record for 1938 the best in the history of coal mining in West Virginia.

The production per fatality at present is approximately 390,000 tons, the best average for any year thus far, having risen gradually from approximately 100,000 tons thirty years ago. Encouragement is gained from the fact that many mines are producing over a million tons of coal per fatality.

The use of rock dust has increased from nothing a few years ago to a total of 40,000 tons a year, in approximately 200 mines. The rock dust applied averages about 1.6 pounds per ton of coal mined in all rock-dusted mines.

A new system of inspecting and reporting on mines was started this year by the Department of Mines. The recommendations for safety have been given to officials and employees in advance and their compliance with the standard recommendations is checked on inspection.

### Fraudulent Eye Injury Claims

Industrial eye injuries—as most employers know only too well—frequently result in claims or suits for damages. Very often it is difficult to decide the extent of the injury, thereby complicating a just settlement. In addition, claimants may deliberately sham loss of sight to collect damages to which they are not entitled.

To protect both employer and employee, an eye shamming test was recently made available. The value of this Polaroid malingering test, developed by scientists of the American Optical Company, Southbridge, Mass., has just been dramatically proven. A $50,000 damage suit had been filed against a truck company in the common pleas court of Akron, Ohio, the plaintiff alleging that injuries suffered in an accident involving the truck company had destroyed the sight of the right eye.

A doctor who had examined the plaintiff

[*Continued on page 22*]


# OIL DERMATITIS —?— WESCOL!

- **WESCOL** is a powerful disinfectant guaranteed to be 18 times as strong as pure carbolic acid when tested against a vigorous culture of B. Typhosus by the Hygienic Laboratory Phenol Coefficient Method of the U. S. Public Health Service, or the F.D.A. Method of the U. S. Department of Agriculture.
- **WESCOL** is used in cutting oils and compounds and helps keep the material sterile and assists in safe-guarding workers against oil dermatitis.
- **WESCOL** does not change the efficiency of the material in which it is used and will not injure its cooling properties.
- **WESCOL** is economical to use because only one pint is necessary for each 50 gallons of cutting oil (ratio, 400:1) to accomplish its purpose.
- **WESCOL** has proven its great value to many large industrial plants and factories in cutting down oil dermatitis infections and reducing compensation losses.

***Send for free booklet for more detailed information.***

**WEST DISINFECTING CO.**

**42-16 Barn St., Long Island City, N.Y.**

***Products for the Promotion of Sanitation***

**West Disinfecting Company**
**Dept. OS, 42-16 Barn St., Long Island City, N.Y.**

Please send your free booklet on WESCOL.

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# Useful Free Literature ★

**The publications briefly described in this service department are prepared by manufacturers' technical experts. The data they contain on equipment, supplies and prevention methods applies to varied phases of occupational hazard problems.**

### 098—VACUUM CLEANERS

"The Dollars and Sense of Modern Cleaning" is the title of an 8-page bulletin of the Invincible Vacuum Cleaner Mfg. Co. Pamphlet describes the proper use of vacuum cleaning equipment and includes performance reports of various companies on time and money saved.

### 099—ELECTRICAL EQUIPMENT

A condensed catalog of safety equipment for utilities and power plants has been issued by the Williams & Company. Lineman's Safety Straps and Belts, Buckets, Linehose Bags, Tool Bags, Rubber Blankets, Rubber Gloves and Leather Protector Gloves, Head and Eye Protection, and other miscellaneous equipment are listed and described.

### 100—SAFETY SHOES

Lehigh Safety Shoe Co. has just released a new 8-page booklet containing technical data and illustrations of 41 different safety shoes for use in all industrial operations.

### 101—COMBINATION LINESTARTER

A new catalog, illustrating and describing the features of the new "De-ion" Combination Linestarter has been announced by Westinghouse Electric & Manufacturing Co. Catalog describes operation and safety features of unit.

### 102—CAR PULLERS

Specifications, dimensions and engineering information on how to select the proper car puller are included in a two-color catalog just released by the Stephens-Adamson Mfg. Co. Also includes information on Hoists and Winches.

### 103—AIR COMPRESSOR

Schramm, Inc. has issued an attractive 16-page catalog listing and describing their line of air compressors, all of which embody the feature of electric self starting.

---

**FREE LITERATURE COUPON**

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### 104—NON-SLIP WAX

A folder of the Flexrock Co. lists the advantages and uses of a new non-slip floor wax for industrial use.

### 105—PLATFORM TRUCK

Elwell-Parker has issued a bulletin describing low lift platform trucks, with illustrations showing typical applications in various industries.

### 106—FUME COLLECTOR

Illustrations showing actual use of equipment, and descriptions of fume and dust collectors are included in a catalog of the Ruemelin Mfg. Co.

### 107—AIR FINISHING

Paasche Airbush Co. has just issued a new 48-page catalog illustrating and describing many different safe mechanical methods for aircoating, airpainting, airfinishing and airsanding. Of particular interest to the painting field.

### 108—MOTOR STARTERS

Five point protection is stressed in a new bulletin of the Westinghouse Electric & Mfg. Co. The bulletin describes safety features of oil immersed motor starters.

### 109—EYE SHIELD

Willson Products, Inc. announces a folder illustrating and describing a new "Protecto-Shield," designed to fit over prescription spectacles.

### 110—VENTILATING EQUIPMENT

South Bend Air Products Co. has issued an attractive catalog on ventilating equipment. Catalog contains descriptions and pictures of units, and specifications.

### 111—DUST COLLECTORS

A 16-page catalog of the Claude B. Schneible Co. describes and illustrates multi-wash collectors, giving installation and operating details.

### 112—SEMI-CIRCULAR WASHFOUNTAINS

Bradley Washfountain Co. announces a four-page folder illustrating and describing semi-circular washfountains now available in enameled iron and stainless steel.

# FOR SAFE
## WIPING CLOTHS DEMAND THIS SEAL!

Prevention is, of course, the chief dermatoses problem. And, according to the U. S. Public Health Service,—"Cleanliness is of Prime Importance."

Wiping cloths produced and distributed by Sanitary Institute Members are guaranteed clean—sanitary—sterilized. Every cloth is thoroughly boiled in a solution containing 76% caustic and/or chloride of lime and dried at an average temperature of over 212° Fahrenheit. For absolute certainty that wipers are actually *sterilized* and safe to use, insist on the Sanitary Institute label on every bale or carton.

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# WHAT'S YOUR SAFETY PROBLEM?

## BREATHING HAZARDS?

You will find the correct answer in the more than 40 types of

## PULMOSAN RESPIRATORS

**for Dusts, Fumes, Gas, Smoke, Sprays**

The most complete line on the market. Every model carefully engineered to give high safety, comfort, ease of breathing and economical service. Tell us your needs.

## CHEMICAL HANDLING?

Here are many valuable safeguards:

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- Carboy Tilter
- Carboy Drainers
- Acid Siphons
- Acidproof Gloves, Goggles, Aprons
- Fume Respirators
- Acidproof Pails and Dippers
- Acid Hoods
- "Ply" Skin Protectives

## Welding Safety?

- Helmets
- Face Shields
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- Respirators
- Electrode Holders

## Workers' Safety?

- Safety Goggles (All types)
- Safety Clothing (Aprons, Gloves, Leggings, Spats, Shoes, Toe Guards, Suits, etc.)
- Safety Hats
- Safety Belts
- Masks
- Machine Guards
- Safety Ladders
- Ladder Shoes

## Plant Safety?

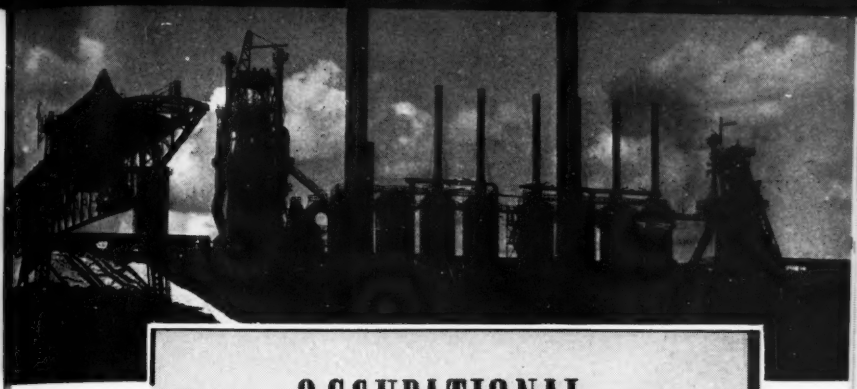
- Waste Cans
- Safety Cans
- First Aid
- Safety Tools
- Bulletin Boards
- Safety Signs
- Etc., etc.

• **WRITE** *for information and prices on any problem or product for safety. Ask for complete catalog.*

INDUSTRIAL SAFETY EQUIPMENT ASSOCIATION

**PULMOSAN SAFETY EQUIP. CORPORATION**

**Dept. OH, 176 Johnson St., Brooklyn, N. Y.**



# OCCUPATIONAL Hazards AND Safety

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Front cover: Periodic physical examinations are a basic phase of every effective safety program. Photo courtesy International Shoe Co.

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Irving B. Hexter, President
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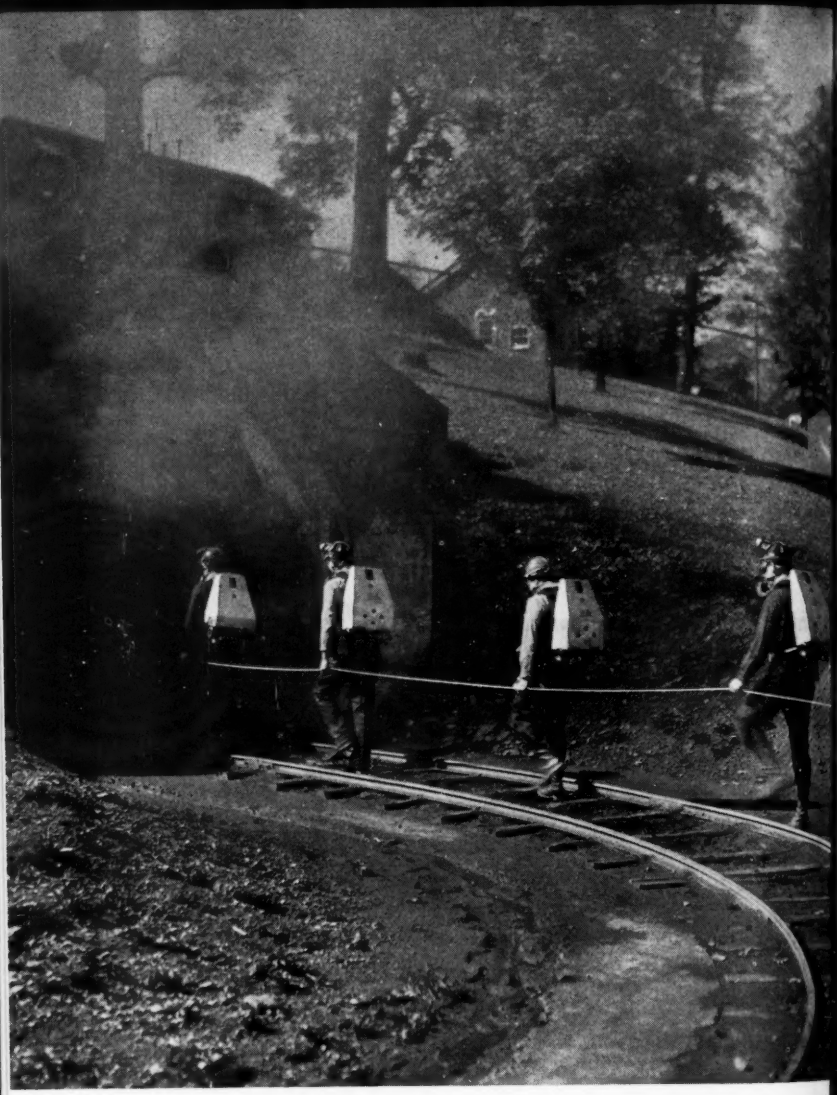


A rescue crew entering a mine following an explosion cave-in. Modern mining methods and equipment have greatly reduced such accidents, while modern safety programs and equipment have coincidentally reduced the hazards of rescue work.

# A Mine Safety Program With A 93% Improvement Record

*By* H. C. HENRIE
Phelps Dodge Corporation

PHELPS DODGE CORPORATION has been engaged in accident prevention work for more than a quarter of a century. In 1913, when safety work was inaugurated at one of its mining properties, industrial accident prevention work was in its infancy, and it was difficult to convince either employer or employee that accidents could be prevented.

During the subsequent years we have seen the industrial safety movement develop from this small beginning to its present day status, where practically every industrial concern of any consequence is engaged in some form of safety work.

As a measure of accomplishment, available accident statistics indicate that industrial fatalities have been reduced 44% during this twenty-five year period, and that the national industrial frequency rate has decreased 61% during the past twelve years.

Although the accident rate of the mining industry has shown a gratifying decrease, statistics indicate that it is still the most hazardous occupation in which large numbers of persons are employed. It is generally recognized that, due to the nature of the work, the prevention of accidents in mining operations is far more difficult and complicated than in other industries. However, the many excellent safety records established by individual coal and metal mining companies during recent years have demonstrated that accident prevention work, can make mining operations as safe as other occupations.

In the early years of our safety efforts several systems of administering the work and many methods designed to stimulate interest and promote safety education were tried with varying degrees of success. Progress made, however, was not satisfactory

due to the tendency of the supervisory staff to regard accident prevention work as the safety inspector's job instead of a job for the entire organization. This lack of interest and cooperation shifted the entire burden to the Safety Department which was unable, single-handed, to obtain the desired results.

In 1925, in order to correct the prevailing unsatisfactory situation, the plan of administering safety work was reorganized, and a committee system, modeled after a plan used for many years by the U. S. Steel Corporation, was adopted. The beginning of permanent improvement dates back to the adoption of this plan.

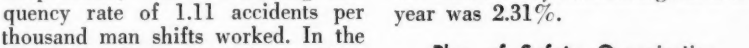
During the year 1924 there were 2,829 accidents at the various coal and metal mining properties of the Corporation, with a resulting frequency rate of 1.11 accidents per thousand man shifts worked. In the nine succeeding years the accident frequency rate decreased steadily, only 13 accidents occurring in the year 1933, with a frequency rate of 0.039 accidents per thousand man shifts worked. This represented a decrease of 96.5% from the 1924 experience. However, during the latter year mining operations were conducted on a greatly reduced basis and the personnel consisted largely of long-service employees, so the principal value of the foregoing figure is to indicate what can be accomplished with a safety-conscious organization.

Since 1933 the expansion of operations has resulted in the employment of a large number of men, many of whom had no previous experience in mining. This condition necessitated a more intensive training and educational program.

During 1937, at all metal and coal mining branches of the Corporation, 167 accidents occurred with a resultant frequency rate of 0.077 accidents per thousand shifts, a decrease of 93.0% below the 1924 rate. The accident severity rate during the same year was 2.31%.

## Plan of Safety Organization

The present system of administering safety work, which was adopted in 1925, was designed to correct certain weaknesses in our former procedure. As our previous experience had very definitely indicated that the



Miners charging a boulder blast hole with dynamite. Safety programs and safety equipment have taken many mines almost entirely out of the especially hazardous occupation class.

responsibility for effective accident prevention work rested primarily on the executive officers and management of the company, it was felt that if this group would devote a reasonable amount of time to safety work the accident record of the Corporation could be improved. To accomplish this objective, a committee known as the Corporation Safety Committee was established.

This committee, consisting of the vice-president of the corporation, the general manager of the corporation, and the managers of the various branches, is responsible for the administration of the accident prevention program. Meetings are held approximately every four months and are arranged so that the committee visits each of the different branches or subsidiary companies in rotation. At these meetings, the accident prevention work of the various branches is reviewed, the accident record of the corporation analyzed, and methods for improving practice and new innovations studied.

This committee has now been functioning for a period of fourteen years, and has been successful in developing a definite and uniform safety policy. Through it, methods and practice at the various branches have been standardized to a very large degree. The active participation of the management group has been in a large measure responsible for the progress made in reducing our accident rates.

At each branch or subsidiary company there was established what is known as the Branch General Safety Committee. This committee, consisting of the local branch manager, who acts as chairman, and the superintendents and department heads, is

[*Continued on page 39*]

Two antiquated, undependable survivors of early mining practices: Above, the canary detector of carbon monoxide: Below, a homemade car wheel scotch block.

# Dust and Fume Control Engineering

*By* Ernest F. Fisher
Industrial Engineer
Boston, Massachusetts

OCCUPATIONAL hazards and safety have a close association with dust and fume control. A dust and fume laden atmosphere in a factory is no more conducive to safety of life and limb than it is to the well-being of the worker and is considered hazardous to all who must work in such an environment.

Various State legislative enactments have recognized this fact and those agencies charged with alleviating and correcting these conditions are striving for progress in accident prevention and health conservation, which contribute toward a better nation and benefit not only the employee but the employer as well.

Coincident with these laudable efforts has evolved a highly specialized branch of engineering that may be termed for lack of a better name, Dust and Fume Control Engineering. This is taking a prominent and important place in industry as most industrial processes and operations are dust or fume creating or both, involving constant control not only from an economic standpoint but from the standpoint of employee welfare and safety also.

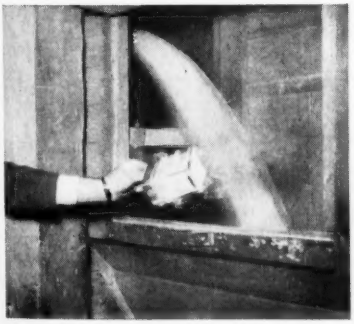
This branch of engineering concerns itself solely with the control, collection, suppression and disposal of industrial dusts and fumes. Dust and fume control deal altogether with air borne solids which contaminate the atmosphere of industrial plants and arise from manufacturing operations and processes. These solids may be valuable by-products out of control of the process or operation

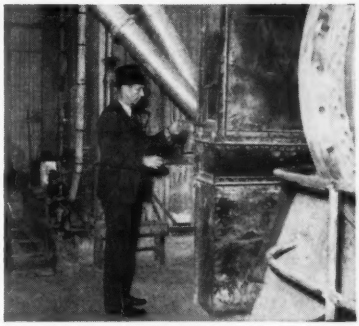
or just plain nuisances that have little or no value. In either case they must be controlled.

Where air conditioning deals with comparatively small concentrations of air borne solids, Dust and Fume Control deals with concentrations up to the ability of the air to carry the particles in suspension. The air is used solely as a vehicle of transportation, whereas in air conditioning the air is used to provide comfort conditions only or assist in a process. In one case, air is the "freighter" and, in the other case, the "freight."

Formerly it was considered necessary only to remove the dust or fumes from the interior of the factory and exhaust it to the wide open spaces, especially if the product had little value and was considered only as a nuisance. When the dust had value, the dust laden air was discharged into a dust collector which retained the bulk of the coarse or heavy dust. The fine dust would escape into the atmosphere because of the inability of many cyclone type collectors to retain this fine dust. Most of this fine dust eventually found its way back into the plant or adjacent homes. This is the dust that presents the greatest nuisance problem to industry in spoiling finished products and polluting the atmosphere with its presence.

Testing the exhaust "draw" of an enclosed silica conveyor, a type of periodic check in good plants.





A dust and fume engineer checking the efficiency of a conveyor exhaust between a grinding and vibrating machine.

Today there is available to industry highly efficient dust and fume control equipment that leaves no excuse for the toleration of dust and fumes from any standpoint. Indeed, industry is finding it highly profitable to use this equipment instead of less efficient equipment or no dust and fume control equipment at all.

Necessarily Dust and Fume Control involves higher air velocities than are encountered in air conditioning. Some dusts are held in suspension in low velocity air while other dusts require high velocity air to transport them in pipes or ducts. Efficient dust and fume control calls for "air engineering" of a high order as large volumes of air are handled compared with the amount of dust or fumes involved. It may require 16,000 C.F.M. to collect and convey 2,000 pounds of dust during a day's operation with an expenditure of 35 H.P. per hour.

[*Continued on page 37*]

# Giving You a Lift . . .

*By* F. M. Blum
Chief Engineer, Electrical Dvision
The Harnischfeger Corp.

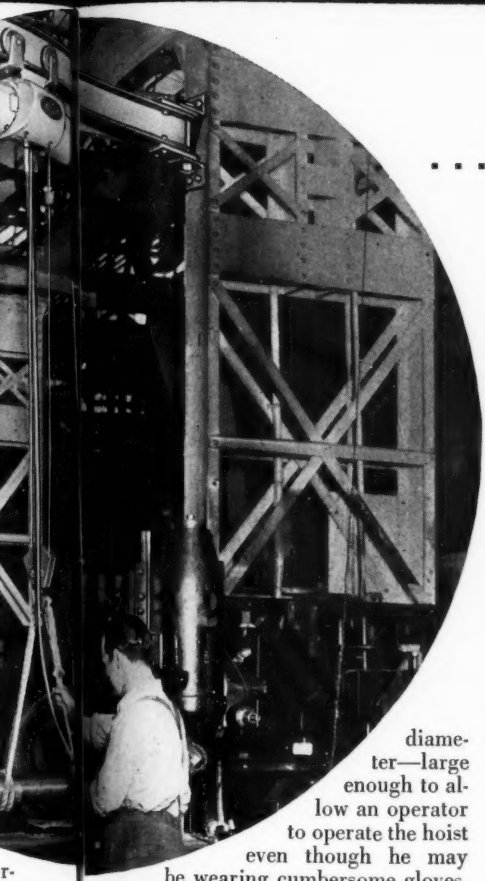
WHEN he thinks of "what's new in safety developments," John Q. Citizen probably gets a mental picture of the many improvements made in his automobile or in his wife's kitchen stove, in the town traffic system or in his savings account which is now federally insured. Mike, the steel worker, sees another angle to it in the new scaffolding he uses, the safety nets on his job and the composition helmet they make him wear. Still another angle, and one which is little discussed though very important, is that which is seen by men in every industry when they look at their new modern hoists—typical of tens of thousands of hoists which are now being used to lift, lower and move materials in the process of manufacture in plants throughout America.

Comparing them with those made in the car industry, the improvements made in the design of the modern hoist have been just as far-reaching and notable. Formerly a bulky, heavy contraption consisting of open gears, exposed motors and not-too-dependable brakes, the hoist of today is a real example of engineering ingenuity, featuring more all-steel construction, high and sometimes variable speeds, great ease in operation, extreme safety and dependableness. Specifically, some of the most important safety features incorporated

in the modern hoist are push-button operation, full magnetic control, double braking, totally enclosed gearing and bottom block, as well as automatic re-set plugging type limit switches. It might be well to analyze these features separately to see how well they further the ideal of safety.

The main feature of push-button control is found in the push-button stations which are suspended from the hoist by a sturdy, rubber-covered cable. These operating buttons in the push-button statien are made of molded bakelite and are large in

# . . . With Utter Safety



diameter—large enough to allow an operator to operate the hoist even though he may be wearing cumbersome gloves. The molded bakelite buttons assure complete safety in operation as they provide more than ample insulation to the live parts within the push-button case. The push-button station is also grounded to the hoist to protect the operator in case of a grounded wire. Of the "hold-down" type, these push-button stations provide an added safety feature in that as soon as the button is released the hoist will stop operating. Should the operator trip and fall and relax his grip while moving under a load, the hoist automatically stops functioning—machines, as well as men, are protected.

Extremely complicated to the average layman, the intricacies of full magnetic control are hard to understand—but their results are not. With the old face-plate type controllers, when the main motor current was broken, frequent arcing was caused to roughen the surface of the contacts, often making it hard to operate and preventing the controller from returning to the off position by its return spring mechanism. Also, in conjunction with the face-plate controller, a limit switch which also ruptured the main motor current was necessary. These heavy currents, being broken by a safety device such as a limit switch, caused burning of contacts and flashing over, and could not serve as a final safety measure.

Reversing magnetic contactors, designed for the purpose of reversing, energizing and breaking the main motor current, were a great step forward in the safety of the modern hoist. The magnetic contactor is quick in making the contact and equally fast in rupturing the motor current. Many means have been designed to quench the arc caused by breakage of the motor current, thus insuring longer life to the contact with no tendency of the contact to stick or freeze. In the case of hook-suspended hoists, this is quite an important safety feature. The

clapper type contactor has a safety device known as the magnetic latch, which prevents its accidental closing due to tilting unless the operating coil is energized. Also the modern reversing contactor allows a more foolproof and safer limit switch.

### The Modern Limit Switch

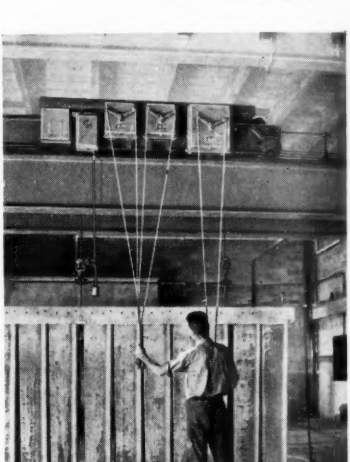
The limit switch is not compelled to break the main motor current as was formerly the case. It breaks only the current going to the coil circuit of the raising contactor. Of the weight-operated type, the limit switch has the counterweights suspended around the dead end of the hoist cable. This, in conjunction with further refinements, makes it absolutely impossible to hoist a load so far that the drum is injured. It prevents the hoist from operating when the limit switch is inoperative.

Double braking is the standard practice with the modern hoist—the stopping brake being usually of the disc design, with ample capacity to insure smooth stoppage without injurious jarring. This brake is operated electrically through a solenoid which is energized at the same moment the motor is energized. When energized, solenoids overcome the spring pressure on the brake; and in the case of power failure the brake will always be set and can only be released manually.

To prevent the load from getting beyond control in the lowering direction, a mechanical load brake is provided—also of the disc type. It operates in an oil bath; and its operation is entirely dependent upon the load on the hoisting drum. When operating the motor in the lowering direction, the motor opens this load brake sufficiently to allow the brake to slip and lower the load gradually. To further the safety of the modern hoist and protect it in the lowering direction, the hoisting cable rope socket, which is set into a slot in the drum, is designed in such a way that should the hoist be operated in the lowering direction to a point where all the cable is unwound from the drum, this rope socket will drop out of a slot and thereby prevent the cable from re-winding in the opposite direction.

With gears fully enclosed and running in an oil bath, flimsy gear guards formerly employed are eliminated—proper lubrication and safe operation are insured. In the case of a motor-driven trolley hoist unit, many precautions are taken to prevent the hoist from dropping from the beam in case of a trolley wheel shaft fail-

[*Continued on page 36*]



Rope controls do not permit operators to give as undivided attention to crane movements as do push-button types.

# Salt-Conditioning Against Heat Fag

***Spring is the time for industry to install dispensers and educate employees in the use of salt before the months of greatest heat fag arrive.***

*By* N. C. Deering

CHARACTERIZED by symptoms ranging from dramatic collapse to minor cramps and lassitude, heat fag is a year around hazard for workmen in the high temperature operations of several industries. Greatly aggravated in the summer months, it is a hazard expanded at that time to include a substantial percentage of all industries. The former include smelting, open-hearth, foundry moulding and similar types of work.

Heat cramps or heat fag is the manifestation of deficiency of NaCl, sodium chloride or salt, one of the 18 primary mineral salts which, with calcium and water, are the chief constituents of the body. Particularly susceptible to loss and consequent disturbance of normal balance is sodium chloride, by virtue of its admixture with skin secretions and its evaporative release.

The finely attuned temperature control mechanism of the body attempts efficient operation even at the expense of other bodily functions, for life itself depends on the maintenance of an average temperature of 98.3 degrees, within a maximum range of from about 85 to 108 degrees. Disturb the normal amount of balance of the elements of perspiration, chiefly water and salt, and the effects, dependent on the amount of the disturbance, will completely incapacitate a worker, or at the least will slow him down and impair his efficiency.

Thirst alone is, unfortunately, insufficient warning of an approaching deficiency of salt in the body, and water alone is not enough to replace the elements lost in perspiration. Workers can see and feel the moisture they lose from their bodies, and being thirsty, they naturally replace the depleted water supply by drinking water. But they can't see the salt which is lost in this same manner. Unless the perspiration happens to get into an open wound, where it "stings," or into the

mouth where it tastes "salty," workers are unaware of the fact that the body salt supply is being depleted. Neither is there any natural desire to replace salt. Yet, salt is as vital to the comfort, health and efficiency of the worker as food and water.

Heat fag in its aggregate effects forces a high tribute from industry although, until quite recently, existence of this hazard was recognized only when rather violent cramps actually forced a worker off the job. There really is no way to estimate losses occasioned by less serious attacks, any more than it is possible to estimate losses resulting from sheer laziness.

Counter-balancing the unfortunate fact that the need for salt replacement is not obvious to workers, is the fortunate fact that heat fag and heat cramps are among the easiest, simplest and most inexpensive industrial hazards to eliminate: Provide supplies of salt and use instructions immediately adjacent to drinking water sources, and impress the importance of the matter on all employees working and perspiring in high temperature operations. Sanitary dispensers, with the salt in convenient, standard 10-grain tablets, are now available from several manufacturers. A great many companies have made a general practice of such installations. There is a preference in some industries for combination salt and dextrose tablets over straight sodium chloride tablets.

It has been proved, not only by medical science, but by actual use in industry, that salt will prevent heat cramps, and it has also been proved that the proper use of salt for this purpose in itself, will not cause hardening of the arteries or have other harmful effects. As long as a "body salt loss + body salt replacement = normal body salt content" equation is maintained, there can be no danger in using salt as a preventive measure.

"Salt conditioning" performs a job that nothing else can. Fans are inadequate in most instances where the hazard exists, and air-conditioning is generally impractical. "Salt conditioning" performs a natural and normal function in the body and it prevents heat cramps as the employee works.

A LETTER which the writer addressed to several score companies to obtain experience records on heat fag, and its prevention in the manner described, elicited such a unanimity of opinion and similarity of results that the simplest summation is the following direct quotation, from L. P. Shepard, personnel director of the American Smelting & Refining Company's Federal Works at Alton, Illinois:

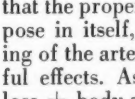
"We have 31 Scotch Hearth Lead Furnaces, open hearth furnaces. In the past it has been taken for granted that we would have heat cramps and sickness. There have been as many as seven or eight in a single day during a heat spell.

"In 1935 we installed a few salt tablet dispensing machines, but were skeptical. They gave such good results that we have since installed one at every drinking fountain, twenty-two in all.

"During the summer of 1938 we had but one case of heat cramps, and suspect that something he ate had as much to do with it as heat.

"The men have become educated to the use of salt and I believe that if we were to discontinue the use of it, it would cause as much trouble as if we discontinued furnishing water to drink."





# WORKERS' ENEMY NUMBER ONE

*By* CARL D. OSBORNE, M.D.
and JAMES W. JORDON, M.D.

DERMATITIS outranks all other industrial conditions of the skin from the standpoint of time lost, suffering and unemployment, and money spent in compensation. It is the most troublesome and costly of occupational diseases, responsible for approximately 65% of claims for the payment of compensation in the United States. It is only logical to believe, therefore, that anything that can be done to reduce the presence of this disease in American industry will prove not only beneficial to industrial management, labor, and the public, but will save money in many ways. It is our belief that, with the utilization of scientific facts now available, the cost of industrial dermatoses can be reduced 50%.

The term "industrial dermatitis" includes inflammation of the skin due to primary irritants, such as strong acids, alkalis, metallic salts, soaps, cleansers, and physical agents; and sensitization dermatitis in which a specific skin sensitivity is the underlying cause.

Many chemicals and industrial compounds may produce dermatitis in workers. Among these substances are acids, alkalis, hypertonic solutions, soaps, gases, vapors, fat solvents, cement, plaster, lye, metallic oxide and hot water. These agents may exert action on the skin in vari-

ous ways. The type and degree of reaction depend on the character of the substance, the concentration and the degree of exposure to the irritant.

The incidence of irritative dermatitis in American industry is high. Yet, there is little excuse for its development since relatively high concentrations or long periods of exposure are required to produce irritative dermatitis. Mechanical means of protection and education of the worker are usually sufficient means of prevention. Protection includes the use of acid-resisting and alkali-resisting gloves, aprons and shields. Impervious pastes and ointments, and adequate facilities for cleaning the exposed parts of the skin are also of vital importance.

Irritating fumes and dust should be removed at their source by properly installed suction hoods and adequate ventilation. This type of equipment has proved its efficiency in numerous lines of industry. To assure proper installation and accomplishment of its purpose, the engineer and the dermatologist must work together.

In many instances, a simple irritative dermatitis is caused by agents used to cleanse the skin at the close of work, rather than by substances handled during the working day. Fat solvents, such as turpentine, and strong alkalis, including soaps, have frequently been found to be the cause of irritative types of dermatitis.

## Dermatitis from Skin Sensitivity

Experience has shown that almost any chemical compound will produce this type of dermatitis if the duration of exposure is for a long enough time, and if the concentration is high enough. With the rapid advance of new chemical compounds, the number of these substances is growing larger daily. Not only are workmen exposed to eczematizing agents at work, but they are also exposed in other places.

Many industries present greater dermatitis hazards than others. Workers handling dyes, formaldehydes, lacquers, turpentine, chromium, nickel, resins and munitions are more apt to develop a sensitivity than workers in other industries.

Prolific of dermatitis cases. Despite little use of acids or skin irritants, machine shops are prolific of dermatitis cases—traceable to cutting oils.

Prompt first aid treatment of cuts, skinned places and incipient infections goes a long way towards control of industrial dermatitis.

The problem of preventing this type of dermatitis should be approached from four angles: the proper selection of workers; the elimination of unnecessary hazards; the prevention of exposure to sensitizing substances; and the early recognition of the condition with the elimination of future contacts with these substances.

## Selection of Workers

With few exceptions one type of skin is just as easily sensitized as others. In certain industries, where gases and dusts are present, a dry skin is advantageous. In others, where liquid irritants are used, a moist skin is desirable. Thus, the type of industry and the nature of the products being utilized determine the value of a dry or moist skin condition.

The pre-employment performance of patch tests to substances to be handled in work is of almost no practical importance, inasmuch as a varying period of contact is necessary to produce sensitization which leads to sensitization dermatitis. Inasmuch as the worker would not, in all probability, have contacted the substances with which he would work in the future, such a sensitization would rarely be present. If tests are to be employed, it is better to use 10 well-known eczematizing substances in order to determine the sensitization index in the individual. This method, of course, may be impractical in many industrial plants. The presence or history of a contact eczema or ringworm infection is more important than the performance of patch tests. Persons with such a history are more readily sensitized to other substances than normal persons and they should not be employed in the handling of substances of a highly eczematizing nature.

## Elimination of Unnecessary Hazards

Compounds which have a high sensitizing index should be replaced with less harmful compounds. Certain oils, accelerators used in the rubber industry, paint solvents and soaps and

cleaners vary in their tendency to produce sensitization. In order to eliminate these more harmful compounds, the industrial dermatologist should look for specific cause of an outbreak, and the chemist should seek a less harmful compound which may be used as a substitute. Special care should be taken with the introduction of new compounds into industry to make certain that they are not sensitizing agents, or contain such agents.

### Prevention of Exposure

Numerous methods of prevention of exposure have been employed successfully in many industries.

1. Closed Methods of Manufacturer—Valuable to prevent all forms of dermatitis and to prevent poisoning from gases and dusts.
2. Exhaust Systems—Use of exhaust hoods to carry off gases, fumes and dusts at their point of origin.
3. General Ventilation—In addition to exhaust, good ventilation is necessary to prevent the contamination of the general atmosphere.
4. Plant Cleanliness—Work benches, walls, floors and pipes should be cleaned frequently to prevent the accumulation of toxic dusts. Some of the most severe cases of dermatitis have occurred in maintenance men such as pipe fitters and electricians, who come into contact with dusts which have been present on equipment for many months.
5. Proper Work Clothing—Protective clothing, including chemically resistant aprons and gloves, supplying the maximum degree of protection should be issued to all workers handling substances potentially dermatitis producers. Frequent changes should be provided and the clothes kept clean and in enclosed lockers.
6. Proper Cleansing Facilities—Shower baths and washing facilities should be made available to all workers. Proper cleansing agents should be supplied. Strong alkaline soaps, lye, turpentine, gasoline and various abrasive cleaners should not be used. Cleansing agents should be limited to olive oil, liquid petrolatum and non-irritating soaps.
7. Instructions to Workers—Workers should be instructed concerning hazards to the skin in connection with their work. They should be informed of the ways dermatitis may be produced and prevented.

### Treatment of Dermatitis

The appearance of dermatitis in any one worker should lead to a close observation of other workers handling the same substances. Any skin eruptions should be reported immediately, and proper treatment and care exercised under the direction of a physician. The question of first aid treatment of industrial dermatitis is very important. Simple wet dressings, lotions and ointments are usually all that is indicated for treatment.

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## THE SAFETY VALVE

*[Continued from page 3]*

in his office was called on the stand. He testified that the malingering test had clearly showed the plaintiff could see equally well with both eyes. Then he demonstrated the test in the court room. The jury returned a verdict in favor of the defendant, and the $50,000 damage suit was dismissed!

The functioning of this unique eye test is dependent on the use of Polaroid, a recently developed material which has the power to polarize light so that it vibrates in one plane only. The equipment used consists of a projector, a small screen on which to project test letters, Polaroid spectacles, and a cross slide equipped with Polaroid lenses for use in the projector.

By taking advantage of Polaroid's ability to harness light rays, it is possible for an examiner to cut off a subject's line of sight between either eye and letters projected on the chart, all without the subject suspect-

ing it. In other words, the subject does not know with which eye he is seeing. It is thus impossible for him to fake an injury in either eye, his malingering will be obvious.

## Where Safety Men Meet

March 27-29, 1939, New York City

Tenth Annual Greater New York Safety Conference. W. Dent Smith, Executive Vice-President, Greater New York Safety Council, Inc., 60 East 42nd St., New York City.

April 3-4, Boston, Mass.

Eighteenth Annual Massachusetts Safety Conference. General Manager, Lewis E. MacBrague, Massachusetts Safety Council, Inc., 80 Federal St., Boston, Mass.

April 18-20, 1939, Columbus, Ohio

Tenth All-Ohio Safety Congress. Thomas P. Kearns, Superintendent, Division of Safety and Hygiene, Industrial Commission of Ohio, Columbus, Ohio.

May 9-11, 1939, Chicago, Ill.

Seventeenth Annual Midwest Safety Conference. George G. Traver, Manager, Greater Chicago Safety Council, 225 North Bank Drive, Chicago, Ill.

May 18-19, Raleigh, N.C.

North Carolina State-wide Industrial Safety Conference. T. A. Wilson, North Carolina Industrial Commission, Raleigh, N.C.

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# New Products

*Additional information and descriptive literature on any of the products mentioned in this service department may be obtained by writing Dept. N, OCCUPATIONAL HAZARDS & SAFETY, 812 Huron Road, Cleveland, Ohio.*

## NEW FACE SHIELD

A new Protecto-Shield for face protection in light grinding operations, wood working, spot welding and other similar operations is announced by Willson Products, Inc. The new shield permits visibility in all directions, is well ventilated and large enough to fit comfortably over correction spectacles. It is made of thick transparent cellulose acetate, is light in weight, and extends well back along the sides of the face. A special knitted sweat pad is provided for wearer comfort. An adjustable molded rubber headband and all other parts are replaceable. Available in clear, amber or green transparent cellulose.

## FIRST AID KIT

E. D. Bullard Co. announces an improved weatherproof first aid kit. The industrial assortment of dressings and treatments in the kit were chosen from a consensus of industrial medical opinion. The

kit is of pressed steel, and is "weatherstripped" to seal the contents of the kit and protect the materials from rain, dust, snow, etc. Rusting is eliminated through this feature, also, because there is no metal-to-metal contact.

## NEW NON-SLIP FLOOR WAX

A new development in floor finishing has been announced by the Flexrock Co., Philadelphia, in the production of a new low-cost, easily applied non-slip floor wax. This new product is designed to aid in preventing accidents from slippery floor surfaces.

# IN THE FIELD

*Statements made in connection with any product mentioned in this service department are based on manufacturers' claims. Although these claims are believed to be true, this magazine does not guarantee that to be the case.*

The wax is produced from pure Carnauba Wax and other ingredients to provide the non-slip feature. Can be used for a hard surface and high lustre finish on concrete, ceramic tile, wood blocks, asphalt tile and other types of flooring. Develops its own brightness and dries to a hard finish in twenty minutes, the manufacturer claims.

## FUSE PULLER

A new line of fuse pullers for pulling and replacing fuses, adjusting switch and cut-out clips, avoiding dangers of shocks and burns, infections, etc., whenever live electrical parts are being handled, is announced by the Trico Fuse Mfg. Co.

This new fuse puller is made of laminations of polished black Bakelite, with metal parts heavily cadmium-plated. It is claimed that the laminated construction greatly increases the strength of these pullers. The device is made in two sizes.

## LIGHTING REFLECTOR

Designed to equalize illumination over a definitely restricted area, Benjamin Electric Co. announces a new reflector, made in accordance with the findings of the IES committee on industrial lighting. This new reflector utilizes a large-area, satinized aluminum reflector that concentrates light over a 54 inch **area.**

## SAFETY SHOES

Lehigh Safety Shoe Co. announces a line of steel toe box safety shoes soled with Dupont "Neoprene," a new rubber compound

that is highly resistant to oils, greases, and most caustics and solvents which cause rapid rotting of leather and ordinary rubber soles. One line of safety shoes carries a full sole of Neoprene, while two other lines are soled with cord moulded in Neoprene to provide additional traction on slippery surfaces.

## HOT SOLUTION PLATING BARREL

A noteworthy advance in plating barrel construction is embodied in the new Mercil plating barrel tank, manufactured by the Hanson-VanWinkle-Munning Co. This new tank is designed for hot solutions, and employs a unique method of exhausting the fumes. A series of small ducts directly over the anode rods connect with the main duct on the side. These individual ducts do not interfere with the placement of cylinders into the tank in their respective saddle brackets, nor do they leave any unsightly cumbersome ducts along the side or above the tanks, according to the maker. Unit is compact and neat in appearance.

## NEW RADIUS HOLDER

A new wedge grip radius holder, employing interchangeable gear-tooth-shaped type for stamping round or curved objects, such as pipes, shafts, forgings, etc., has been announced by the M. E. Cunningham Co.

Instead of straight tapered type, with limited radius, the gear-tooth type can be used on any radius by adopting correct slide for whatever radius is to be stamped. Only one set of type and holder is required for various sized slides.

A feature of the tool is that it is made from non-mushrooming, no-spalling safety steel, insuring absolute protection to workmen from flying particles of steel, the manufacturer announces.

## SPRAY MACHINE

A machine for the semi-automatic spray coating of the inside of small cylindrical objects, such as paper or metal cans, has been developed by the Eclipse Air Brush Company, Inc., 390 Park Avenue, Newark, N.J. The cylinders feed by gravity down an adjustable slide and are released by a manually operated lever onto a rotating device. A solenoid operated spray gun fitted with an extension nozzle is then moved forward to coat the inside, while the cylinder is being rotated. The gun is pulled back and the next cylinder comes down, pushing the finished one on its way. A one-sixth horsepower electric motor operates the automatic part of the equipment. An average production of 10,000 pieces per 8-hour day is claimed for this machine.

## SEMI-CIRCULAR WASHFOUNTAINS

Semi-circular Washfountains of 54″ and 36″ diameter sizes are now available in enameled iron and stainless steel. The fixtures have just been introduced by the Bradley Washfountain Co., Milwaukee, Wis.

Designed by an outstanding industrial artist, the fountains are streamlined, handsome, yet economical, space saving, sanitary. They may be hand or foot controlled and are offered in de luxe or standard models.

They afford all the group washing advantages of full circular Washfountains, and are ideal for the small or narrow washrooms of factories, foundries, mills, mines, shops, stores, offices, schools, institutions.

## UTILITY LADDER

A small, compact, aluminum utility ladder that weighs only 5½ pounds, yet enables a person of average stature to reach as high as eight feet from the floor, has just been developed by the Aluminum Ladder Company, 144 Fifth Ave., Tarentum, Pa.

Meets requirements for a light strong ladder for use in places where objects are stored in high cupboards or shelves. Its small size enables it to be stored under tables or counters where it is out of the way. Equipped with rubber feet, it will not slip or slide, and cannot scratch polished floors.

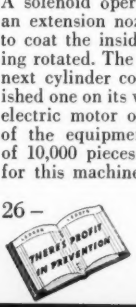
Construction is of Alcoa 51 S.I. alloy, which has a tensile strength of 48,000 lbs. per sq. in., and it is ruggedly riveted together so as to give long service. Both platform and steps are corrugated to prevent slipping.

## LIFT TRUCK

A new liftruck which will raise 5000 lb. capacity loads with a single stroke requiring less than seventy lbs. effort on the handle has been announced by the Service Caster & Truck Co. The truck is mechanical in lifting and hydraulic in lowering. Permits the safe and easy handling and moving of heavy loads. Platform is covered with a steel plate, permitting transportation of other than lift truck loads.

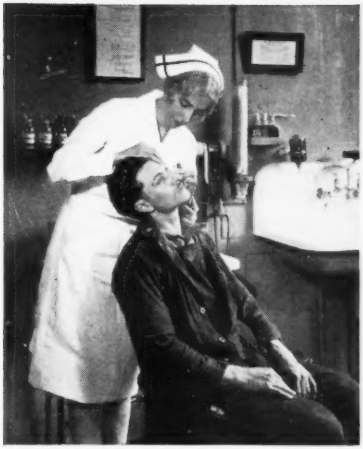
The truck is sturdily constructed for long service as well as for safety. It can be moved with ease and performs a wide number of services in a plant.





# MEDICAL SERVICE IN SMALL PLANTS

*By* VICTOR G. HEISER, M.D.
and DONALD M. SHAFER, M.D.



BECAUSE of the varying types of industrial processes in America today, the term "small" varies considerably within each industrial classification. For purposes of clarification, a plant with less than 500 employees will be considered "small" in this discussion.

The last United States census showed that, in the classification of manufacturers, almost 99% of the establishments had less than 500 employees. In manufacturing companies alone there were approximately 9 million wage earners, of which 6 million were gaining their livelihood in plants with less than 500 employees. Figures show that 15 million persons in small concerns are breadwinners for approximately 75 million people. Certainly, the health of these 15 million wage earners is a problem worthy of the greatest effort.

An important factor facing the small manufacturer and the industrial doctor is that of the hazards to which the workmen are exposed. One survey of a typical industrial area found that workers were exposed to 50 specific substances and conditions. Other authorities list 94 groups of industrial poisons associated with 900 different occupations. In the area where the 50 hazards were found, approximately 20% of the workers were exposed to carbon monoxide, 10% to emery dust, 10% to lead, and 10% to quartz dusts. Also, it was found that about 42% of the workers were exposed to potential accident hazards due to unguarded machinery. *This percentage of potential accident hazards corresponds directly to the percentage of compensated cases due to the same cause, which means that the employer is paying in direct proportion to the extent of the exposure in his plant.*

It is a general belief that the hazards of industrial poisons are present chiefly in the large companies and seldom in small ones. We doubt that this is true because small companies

generally use the same materials as the larger companies, and, although in one particular plant there may not be the same number of hazards that the larger companies have, yet there is an exposure to the same hazards.

Then, too, there is reason to believe that the individual workman in the small plant is exposed to more hazards or to the same hazard in more ways than the man in the large plant. This is ascribed to the fact that in many small plants, because of the limited number of employees, each man must carry out two or more steps in the manufacturing process. Thus he may come in contact with more than one potential poison, or with the same poison in different states or manners.

In addition, it is known that for the number of man-hours worked, the small plant has more time lost due to industrial accidents and more frequent accidents than in the large plant. This greater loss is attributed to the lack of medical service, to a less well organized program of accident prevention and to a want of appreciation of the cost of these losses by the small manufacturer.

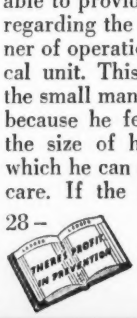
After the small manufacturer has been convinced of the extent of time and production loss by means of records which he should keep, he can then be approached with, or will probably demand, a solution for his problem. At this point we must be able to provide him with information regarding the personnel and the manner of operation of an adequate medical unit. This is the point at which the small manufacturer usually balks, because he feels that in a company the size of his there is no way in which he can afford adequate medical care. If the manufacturer wants to have medical care that is of the superior type he finds that the costs to him of employing a doctor and nurse, even on a very limited part-time basis, are all too often prohibitive and even then he cannot be sure that his men are being cared for by a man who realizes the extent and type of the hazard.

Although the small manufacturer is usually a definite humanitarian and almost always greatly concerned with the welfare of his men, the cost of adequate medical care by the usual means is prohibitive. It has been estimated that the upper limit in the cost of medical care that the small manufacturer can afford is about $13.50 per man per year, and if such care is to be generally adopted it will have to start at a much lower figure. In the beginning, at least, the cost for the small manufacturer should not be over $10 per year per man.

Another factor is the cost of equipment and the space necessary to house it. A great many smaller companies are housed in older factories with no provision made for medical care. The small manufacturer feels that if he can have medical care without devoting to it space, light and upkeep costs in his plant well and good. So in providing medical care the question of floor area and availability of medical equipment to the production equipment, as well as availability of outside supplemental care and equipment must be kept in mind. The equipment necessary for a small employer to purchase must not demand a large cash outlay. Some small manufacturers have indicated that they felt $350 to be the most they could devote to organizing and equipping a medical department.

[*Continued on page 33*]





# Right off the Docket

**The trend of litigation on workmen's health and accident compensation is reflected in these briefs of the latest and most representative cases coming to trial in the intervals between issues. Familiarity with this trend is important to every industrialist.**

## Loss of Eye Due to Removal of Goggles

THE claimant was directing the operation of removing sand from a pit beneath the floor of the company's factory. A large overhead crane, to which was attached a steel grab bucket, was being used for the work. The place of operation was poorly lighted and the grab bucket apparently had become fast in the pit. In an effort better to see the conditions in the pit, the claimant lifted his goggles from over his eyes to his forehead. At that instant the steel cable broke and some foreign object struck the claimant in the eye which resulted in the subsequent removal of the eye.

The company contended that the claimant had been instructed to wear his goggles at all times, and that in taking them off he was guilty of willful misconduct, which under the compensation statute would preclude recovery. The Court rejected this contention, and affirmed an award to the claimant. The Court stated: Willful misconduct means a deliberate purpose not to discharge some duty necessary to safety. It implies obstinacy, stubbornness, design, set purpose and conduct quasi criminal in nature. There must be shown an intentional disobedience to a strictly enforced rule to support the defense of willful misconduct. We cannot say as a matter of law that what the claimant did in this case amounted to willful misconduct.

*American Steel Foundries vs. Fisher (Indiana) 17 N.E. 2nd 840; December, 1938.*

## Award Despite Conflict in Testimony

While taking down slate in the company's mine, the claimant suffered an injury when a heavy piece of slate fell, striking him on the back and knocking him forward so that he fell across a crow bar, one end of which was resting on a pile of coal, and the other on the floor of the mine.

Physicians called by the claimant testified that from their examination of him, the history of the case, and scrutiny of the X-ray pictures, it was their opinion that his disability was caused by the accident. Physicians for the company claimed that from their examination they found no evidence of broken or fractured bones or of traumatic injuries. They testified that the claimant was suffering from ptosis or fallen stomach. These doctors and three eminent physicians called in from Louisville testified they had never known of such a condition of the stomach being caused by traumatic injury.

The Appellate Court stated that it was not its function to retry compensation cases and determine for itself how, under the evidence, the case should be decided, but the sole province of the court in such cases is to determine whether there was evidence of probative value to sustain the award made by the Board. They held that there was competent evidence to sustain the Board's finding that claimant's disability was the direct result of traumatic injury. *Black Mountain Corporation vs. Seward et al (Kentucky) 121 S.W. 2nd 4; Nov. 1938.*

*Digested and compiled by*
HILTON E. ROBERTS
Member Ohio and New York Bars

## Death Resulting From Strain

The Commission had refused an award for the death of an employee. The facts disclosed that the employee, afflicted with a weak heart, and another lifted into a truck a motor weighing 200 pounds, installed the motor in pump house and then attempted to start motor by cranking, that when employee quit cranking he was very tired and exhausted, that he thereafter assisted in lifting bales of hay to a barnloft by driving truck, that after eating a heavy dinner he again drove truck for a short time when he quit work because he felt sick. Some 45 days later the employee died.

The Court annulled the Commission's order, stating: If employee was afflicted with a weak and somewhat devitalized heart and thereafter subjected himself to violent exertion and extraordinary strain in the due course of his employment, which caused his death sooner than he otherwise might have suffered, his dependents were entitled to compensation. *Mark et al vs. Industrial Accident Commission of California, et al; (California) 84 Pacific 2nd 1071; Nov. 1938.*

## Divided Court Affirms Award for Cerebral Hemorrhage

This case deals with a death of which cerebral hemorrhage was the immediate cause. The facts are peculiar. The deceased, a man 69 years of age, had no recent illness other than indigestion. He seemed as well as usual when he left home for work, but collapsed while standing in front of a conveyor. The autopsy showed death from cerebral hemorrhage following a fractured skull, also, that the deceased had three serious heart ailments, any one of which might have proven fatal. The employer failed to produce any witness showing how the accident happened. The commission made an award for the death.

On an appeal the Court was evenly divided and the award was affirmed. The four judges voting to affirm, stated: "In this case defendant made no effort to show the circumstances under which the employee was injured and we believe that the Commission was warranted, upon the established facts, in drawing the inference that decedent met with a compensable accident."

The four judges who dissented, said: "Claimant's death might have been caused by any one of three ailments. The burden is on the claimant to show an accidental injury. Such showing cannot be based upon an inference." *Rogers vs. Ford Motor Co. (Michigan) 282 N.W. 919; December, 1938.*

## Failure to File Claim Within Statutory Period

The Board denied an award for death resulting from silicosis on the ground that there had been a failure to file a claim within six months after the worker became aware of his affliction, as requested by the compensation statute.

The Commission's order was annulled by the Court because of the fact that the employer paid to the worker his wages during and after the six months' period. The Court said: In proceeding to recover compensation for death of mine worker from silicosis, fact that employer, with knowledge of worker's affliction, made payments to worker while he was on a sick leave, tolled the limitation statute requiring compensation claim to be filed within six months after worker became aware of affliction, since such payments were deemed to constitute payment of compensation rather than payment of wages or gratuity. *Morrison et al vs. Industrial Commission of California (California) 85 Pacific 2nd 186; Dec. 1938.*

## Lack of Guards Draws Penalty

A PUNCH press operator in a Cleveland plant was paid compensation for an injury sustained to his hand when a punch press repeated. The injured employee applied for an additional award, claiming violation of the code for the operation of presses, hammers, etc. Investigation revealed that the press upon which the injury occurred was unguarded and was not provided with hand towels in lieu of a guard. The lack of a guard on the machine cost the employer a 50% penalty assessment.

## Showers for Iowa

A bill introduced in the Iowa State Senate at the present session would require factories to install shower baths for employees, subjected to "grease, smoke, dust, grime and perspiration." Many plants now have such facilities. All should have. The passage of this bill into law will certainly be a step forward in industrial health and safety in Iowa.

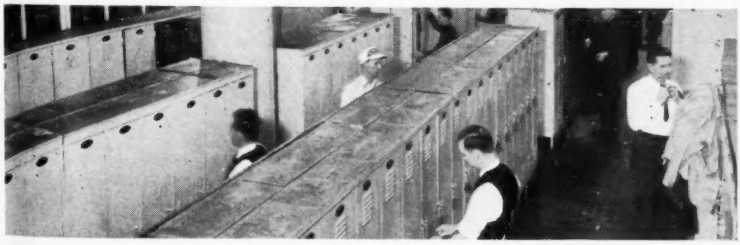
# Cleanliness Is a Paying Proposition

*By* H. Dudley Hanson
Safety Director
Cleveland Graphite Bronze Co.

THERE are several departments and operations in the Cleveland Graphite Bronze Company, as there are in most industrial concerns, in which employees must work in high temperatures or under exposure to various dusts, fumes and gases. Ventilation systems and protective equipment have long been enlisted in the plant, but there is an important factor, personal cleanliness and sanitation, which demands a different attack.

We believed, and physicians and hygienists concur, that a number of occupational diseases—lead poisoning, for one example, dermatoses for another—frequently trace to dirty clothing and inadequate personal cleanliness. Following careful estimates and comparisons of costs versus potential benefits, we launched an addition to the company's safety program that is somewhat unique in several respects.

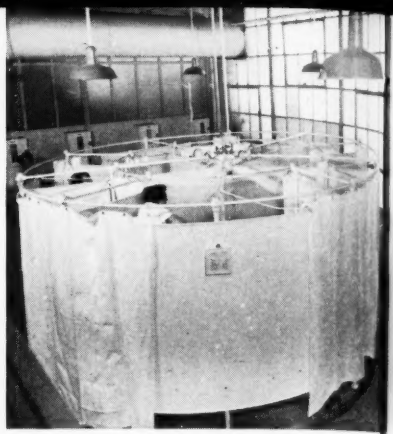
There are three phases of it. First, we established a daily shower plan.



Second, we provided each worker exposed to the aforementioned hazards with two changes of work clothes per week . . . freshly laundered sweat shirts and trousers. Third, we installed banks of dual lockers, permitting separate compartments in which to keep work and street clothes. No charges or fees are assessed workers for any of these services and facilities, in fact, to make the program addition completely effective, we found it necessary to actually *pay* them to execute it.

The latter has reference to the shower plan. We initially asked the men concerned to quit work fifteen minutes before the end of their shifts to take showers. Although to be taken on the company time, this provided no assurance that all of the men would comply, or comply regularly, and it further tended to disrupt production schedules. A few other methods were tried, but in the end we instituted a "shower allowance." This daily allowance or bonus, 25 cents, is credited each man who takes a shower at the end of his shift, and in very few instances do the men fail to take advantage of it. A record book is provided in the shower room for the men to sign their names and time-clock numbers, and an attendant certifies each entry. Bath towels, soap and paper shoes are supplied by the company, and the accumulated shower allowances are paid on regular pay days.

Every employer is familiar with the fact that a certain percentage of employees follow a personal hygiene and cleanliness program of their own initiative and as a matter of course, a certain percentage requires a little encouragement or urging to do the same, and the remainder simply must be "sold" on the whole idea. All three classes, however, respond very definitely to attractive recreation, rest and



One of the ten-place circular shower, stalls, conserving space and plumbing, that are used by Cleveland Graphite Bronze Co.
*Photos by Art Miller Studios*

sanitation facilities. When they are provided and their use is thoroughly encouraged, the average employee finds it difficult to be anything *but* clean and neat in his person, and carries the same characteristics into his work with naturalness and ease.

All of our employees who are exposed to extreme temperatures, dusts, fumes and gases are included in the aforementioned dual locker, free work clothes and shower allowance phases of the company's safety and personnel program. All other employees, however, are encouraged to make free use of our showers—also provided in the women's recreation room—and the other hygiene facilities.

The cost of this program? Oh, yes. The operation and maintenance expenses run approximately $230.00 per week per thousand employees or, based on our average payroll, about fifteen cents per employee per week. The returns? A 22 per cent reduction in absenteeism, and substantial savings in medical care and compensation costs.

## MEDICAL SERVICE IN SMALL PLANTS

[*Continued from page 28*]

The tremendous and complex problem brought up by small manufacturers' needs for medical care is essentially that of education. The small manufacturer himself must first of all learn his need for help from the establishment of comprehensive records, and then what an industrial medical service can do for him. He must be shown how it will influence the quality and quantity of production; what it will do for his workmen; what it will do for the relationship between him and his workmen; how it will affect his costs of compensation; and how he can justify the additional expense to his partners or stockholders. In short, he must be shown that it is not welfare, not philanthropy, but "good business."

All this must be brought to his attention in a manner that will cause him to want to do something about it. At the present time the National Association of Manufacturers, through its Committee on Healthful Working Conditions, and their advisory committee of industrial doctors, along with the National Industrial Conference Board and state manufacturing associations, is carrying on such an educational program.

The problem of bringing medical care to the small industries means realization of the tremendous number of workers and establishments involved; realization of the percentage of absenteeism due to industrial hazards for which there is a low incidence of adequate care today; installation of suitable records and education of the small industrialists as to their value; education of the industrialists as to the meaning and value of an adequate medical and engineering service; education of the industrialists to the fact that an adequate medical service can be obtained at a cost that they can afford and that it is "good business."

* *Abstract of address delivered before the First Annual Industrial Health Congress of the American Medical Association, January 9, 1939.*

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**IN THIS *lightweight* FACE SHIELD**

THE No. 10 Face Shield fills a long felt need in industry and wherever Dust and Dirt are annoying problems. Light weight, snug fit, wide range of vision make it ideal for Truckers, Yardmen, Disc Sanders, Spot Welders, etc., requiring this type protection. Windows button on and are easily changed. These also tilt when not in use as a protective medium and act as visor from Sun, Excessive Light and Glare . . . Aluminum binding permits individual fitting. Genuine leather sweatband backed by wool felt makes for daylong comfort. Available in Clear, Amber or Green Shades.

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DETROIT, MICHIGAN

# This month in *Washington*

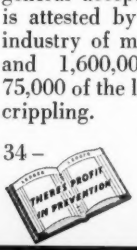
*By* W. T. CAMERON
Chief Safety Adviser, Division of Labor Standards, U. S. Department of Labor

IT IS a well known fact that the distribution and acceptance of an idea, a product or a service lags far behind its development. Great progress has been made in the science of curing and preventing disease, but the problem of equal and widespread distribution of medical services is still to be solved. Does not this "lag" also exist in other fields of human endeavor—the distribution of goods—of education—of standards of living?

During the last quarter century there has been a rapid development of safety techniques and methods for reducing accidents in industry. The patterns and plans have been worked out, tried and proven. We know that by application of these methods accidents can be prevented. However, the lack of widespread distribution and general acceptance of these methods is attested by the annual harvest in industry of more than 19,000 deaths and 1,600,000 disabling injuries, 75,000 of the latter being permanently crippling.

Many groups are concentrating upon this problem of distribution of safety knowledge—the National Safety Council, American Standards Association, workmen's compensation bureaus, insurance companies, governmental agencies, State departments of labor, publishers and safety equipment manufacturers. The safety codes and rules in many of our States show the desire to crystallize existing knowledge and make it applicable to all industry. Though varying greatly as to scope, these State regulations are commonly aimed to remove or control specific hazards which experience has shown are a frequent cause of accidents and injuries. Generally speaking, these code or statutory provisions are less comprehensive and less exacting in their requirements than the measures voluntarily applied by large industrial organizations in carrying out accident control programs. The value of these State regulations in saving life and limb depends almost wholly upon intelligent interpretation





and persistent application. The factory inspector, under the usual State administrative set-up, performs an essential part in giving effect to these statutory regulations.

Any present or future "distribution" of safety and health knowledge through the regulatory approach to the industrial accident problem will largely be ineffectual unless the factory inspector is in fact an expert in the detection of accident hazards and thoroughly conversant with technical and practical methods of eliminating or controlling them. The factory inspector in many instances is the only contact an employer has with the safety movement.

### Plan for Selection

At a recent Washington meeting the Division of Labor Standards' Advisory Committee on Safety and Health prepared a list of factory inspection standards and a list of qualifications for factory inspectors, recommending a plan for the selection, training and retention of qualified factory inspection personnel. This plan is aimed to produce an inspectorate capable not only of completely applying legislative enactments on well recognized hazards, but also able to bring to management the safety methods and techniques so effectively employed by the larger organizations.

Emphasizing the importance of a reasonable assurance of permanence of office for competent inspectors, the committee has stated: "Administrative experience is not only a valuable public asset which should be conserved, but, moreover, insecurity in office for non-service reasons tends to demoralize law enforcement." Or, as Governor Dixon of Alabama said it, a few weeks ago, in his opening speech to the State Legislature, advocating the establishment of a merit system: "Those presently employed have absolutely no security of tenure, and must spend a large portion of their time thinking of and working for the retention of their jobs."

The Advisory Committee on Safety and Health strongly advocates that "The system give qualified inspectors the protection of Civil Service tenure, or its merit rating equivalent. The adoption of a competitive merit system in the selection of inspectors and a sound training program will go far in creating a public consciousness which will not tolerate arbitrary dismissal of qualified inspectors."

If the accident prevention patterns which have been so successful in a number of industries are to be widely distributed, we must recognize the fundamental part to be played by factory inspectors. Through this program of selection of inspectors on a merit basis—of careful training—of elimination of periodic turnover of inspectors for non-service reasons, I visualize a factory inspector who commends the respect of industry and invites the confidence of workers because of his knowledge, integrity, and ability to bring about a greater degree of health, safety and comfort in all industries—both large and small.

## GIVING YOU A LIFT

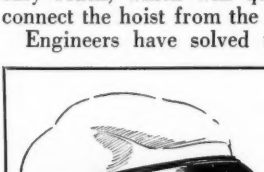
[*Continued from page 16*]

ure. This safety measure is very important, especially if the operator's cage is mounted onto the trolley. When the trolley is controlled by the cage, the controllers are provided with spring return mechanisms insuring their quick return to the arc position. In cage control hoists, the operator always has a knife switch within easy reach, which will quickly disconnect the hoist from the main line.

Engineers have solved this problem in controlling the modern hoist by the use of a compact, five-speed push-button element. A neat six-button push-button station is suspended from the hoist. Each motion of the hoist is provided with five distinct steps of control. Each step is at the control of the operator either in accelerating or decelerating a load. He merely pushes a button for the motion he desires. The farther in a button is depressed, the faster the motor will run. It is possible for the operator to hold the hoist on the first step at very slow speed control and then gradually depress the button and accelerate the load and hold it at any speed desired.

This type of control, alone, adds greatly to the safety of floor-controlled hoist units. It prevents the operator from pulling the wrong rope in case the ropes are tangled or if some object is caught under one of them and accidentally starts the motion. This five-speed, push-button variable speed control is the latest addition to the safe operation of the modern hoist.

All these features, plus the incorporation of modern alloy steels, make the modern hoist a safer unit and by far a more durable unit than the hoist of former days. The modern hoist is compact in design, free of maintenance and fast enough for modern production methods, no matter what the handling job may be.

Type C-5

There are twelve other types.

JACKSON Eyeshields

This eyeshield is of the cover-all type. Light, well ventilated, non-inflammable, *non-fogging* and adjustable to any angle, it has full metal binding and a visor guard that protects the opening between visor and forehead without checking ventilation. Adaptable for a wide range of industrial uses, it is available in clear, smoked, amber and light green. *Send for folder!*

**JACKSON ELECTRODE HOLDER CO.**

**15120 Mack Avenue Detroit, Michigan**


## ORGANIZATION CHANGE

Mine Safety Appliances Company announces that a new office in the company has been created, that of Chairman of the Board of Directors. Mr. George H. Deike was elected to fill that office. Other officers of the company, elected on January 18 are: J. T. Ryan, Pres. and General Manager; J. F. Beggy, V. Pres. and Sec.; Geo. H. Deike, Treas.; J. T. Ryan, Jr.; Asst. Gen'l. Manager.

## DUST AND FUME CONTROL

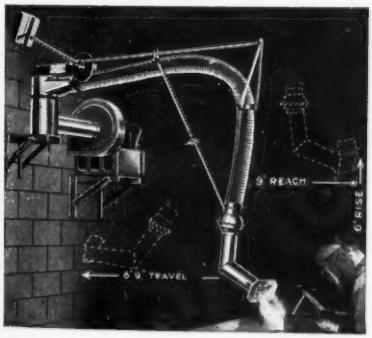
[*Continued from page 13*]

All dust control problems are complicated by the presence in most industrial dusts of small particles of the order of 0.5 microns and up to 10 microns in size. The smaller particles readily float in the air taking hours for settling to the surface. These are the particles that adversely affect the welfare of workers and constitute a nuisance in most industrial plants. These are also the particles that are retained with difficulty by many types of dust control equipment.

The efficient collection of these dusts is no longer the real problem, however. How to separate them from the air used to collect and transport them and retain them for disposal, without again permitting them to escape into the atmosphere, is the real problem.

Efficient collection of dusts and fumes at their sources is the first step in efficient control. This necessarily involves the proper design of hood or enclosure adjacent to the source, without interfering with the process or operation. Connecting all of these hoods with a system of piping that will have the least resistance to the flow of the conveying air through them, is the next step. The final step, which is the most difficult, is to separate the dust and fumes from the conveying air stream so that the air can be returned to the atmosphere free from solid particles, or to the interior of the plant clean enough for the workmen to breathe. Hundreds of millions cubic feet of air per minute are exhausted daily from factories. In the winter all of this air must be replaced with heated air, at great fuel waste, unless it can be cleaned and reused to maintain proper comfort conditions in the plant. This represents a large volume of fuel that could be reclaimed if this air could be returned to the interior of the plant after releasing its load of dust and fumes.

The dust and fume control engineer is charged with the responsibility of utilizing air efficiently as well as collecting dust and fumes at their sources and conveying them to a point where they can be safely released.


**RUEMELIN FUME COLLECTOR**

**EFFECTIVELY removes fumes and gas at the source, exhausting same outdoors. Will eliminate operator fatigue and clear the shop atmosphere of smoke haze.**

**This equipment has been installed by many leading industrial plants. Catalog and prices on request.**

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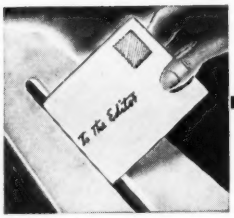
# Questions and Answers




**Individual answers are given to all questions on industrial health or accident matters. A few of the questions received from readers each month are published for their general interest.**

## Painting Ends of Lumber Stacks

WHAT protection should be provided for workers employed in painting the ends of lumber stacks, and in similar operations? Spray guns are used in our plan for that job.

*G. K. M.*
*Eugene, Ore.*

Men handling spray guns in painting the ends of lumber stacks should be provided with respirators. Workers who contact toxic fumes generated by lath baths used in removing stains should also be provided with respirators. Employees handling such poisonous compounds, or wood treated with these compounds should wear rubber gloves, and should protect the exposed parts of the arms with ointments or creams. If the concentration of fumes is heavy in an enclosed place, forced or mechanical ventilation is important.

It is suggested that you write to the State Industrial Accident Commission, Salem, Oregon, for further information on the state requirements on this operation. It is understood that a new code for this operation went into operation in your state this year.

## Control of Asbestos Dust

We would appreciate any information which you can give us on the control of asbestos dust created in willowing operations.

*A. M.*
*Greensboro, N.C.*

High dust concentrations from willowing (opening) operations present a dust hazard in the asbestos textile industry. This dust is created not only by manual operations used in feeding willowing machines, but also by the action of the machines themselves. It is suggested that these dust concentrations may be reduced by using a conveyor type feeder which keeps the materials below the breathing level. Exhaust hoods should be installed above the feeder box and below the machine housing. Pneumatic conveyors should be used to carry the material from the machine to suitable bins, separated from the preparation room.

Competent persons should be employed to make a survey of your willowing machines to determine what the dust concentration is and what type and size of exhaust hoods should be installed for maximum protection.

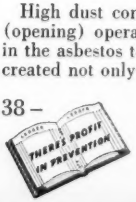
## Disposing of Oily Rags

Recently we had a rather serious fire in one of our finishing rooms caused by some oily waste rags catching fire. Considerable damage was done and two of our men were severely burned. The oily rags are thrown into a metal barrel and emptied at the end of each day. Is there a safer practice to follow?

*S. T. D.*
*Madison, Wis.*

Yes, there certainly is a safer practice. The metal container is not enough. It should be closed at the top to prevent any fire from escaping from the container. There are waste cans which are designed to prevent such accidents as occurred in your plant. These cans meet requirements of insurance companies for the disposal of oily or "hot" rags. The lids are self-closing when the handle is released, and fit over the edges of the container so the fire cannot get out.





## A MINE SAFETY PROGRAM

[*Continued from page 11*]

responsible for the proper administration of accident prevention work at the branch. Through this committee, matters of policy, methods and procedure developed by the Corporation Committee are carried directly to the departmental operating heads. Meetings are held at least once a month, at which time the branch accident record is reviewed, accidents analyzed and classified, methods for improvement discussed, and specific hazards and existing practice studied. Recommendations submitted by the Departmental Safety Committees, many of which involve the expenditure of money, are discussed and passed upon.

In each major department of the branch, such as the mine, mill, and mechanical departments, there were established Departmental Safety Committees which consist of the superintendent, who acts as chairman, and the supervisory staff of the department. Each Departmental Committee is responsible for the accident prevention work in its department.

The Departmental Safety Committees are the key committees of accident prevention work and are the mediums through which it is made a routine part of the operating duties of the supervisory staff. These committees also meet at least once a month, and all accidents occurring in the department are analyzed and classified, and methods developed to prevent repetitions of similar accidents. Methods for improving existing practice and elimination of possible hazards are studied.

In each operating unit of the department, such as a shop or mine division, a Workmen's Safety Committee carries the accident prevention program directly to the day's pay employees, thus securing their interest and co-operation. This committee consists of the foreman, as chairman, bosses, and workmen representing the day's pay employees of the unit. It investigates, analyzes, and classifies accidents within its department.

The workmen's committees have been a prolific source of suggestions and recommendations relating to the improvement of practice and the elimination of accident hazards. Committeemen representing the workmen serve for a three-month period, and through a system of rotation an ever increasing number of workmen are brought into direct contact with the safety program, which is an important educational measure.

The plant safety engineer acts as secretary for all plant safety meetings, compiles accident reports and statistics, and, in conjunction with the Departmental Safety Committees, investigates all accidents. In general, the Safety Department has full charge

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of first aid and mine rescue training and acts as a service department for the entire plant.

We have found that complete and accurate information covering the accident experience of the various plants and operations is fundamental to effective procedure. A detailed written report is required on every accident, irrespective of how slight the resulting injury may have been. Employees failing to report an accident promptly to their boss are subject to discharge.

All accidents are thoroughly discussed and analyzed by the Departmental Safety Committee in order to ascertain just how each accident occurred, the circumstances contributing to it, and the parties responsible.

The information secured through this system of analysis invariably indicates the remedy by which a similar type of accident may be avoided. This remedy may be additional mechanical safe-guarding, the elimination of unsafe tools or equipment, or in other directions that constitute an engineering problem. Again, it may indicate unsafe practice, the need of more complete instruction as to safe methods of doing the work and closer supervision, better enforcement of safety rules, or disciplinary action.

The following illustrations are examples of the practical application in present day practice of the information obtained by thorough investigation and analysis of accidents:

The required use of protective clothing has resulted in marked decreases in certain types of injuries. In 1925, it was ascertained that eye, foot, and head injuries were the contributing causes of 28% of the disabling accidents during the year. To correct this condition the use of goggles was made compulsory on certain jobs, safety hats are compulsory for all underground employees, and safety shoes for both underground and surface work. During recent years these types of injuries have been practically eliminated. After several employees were saved from a serious or fatal injury due to these articles of protective apparel, little difficulty was experienced in enforcing their use. Accidents due to burns decreased from sixty-nine in 1925 to three in 1937.

In 1925 in metal mining operations there were 222 accidents resulting from falls of ground. During 1937 there were 9 such accidents. This decrease was accomplished by the use of Dura-luminum bars, which, being about one-third the weight of steel, permitted the use of longer bars and lessened the fatigue of the operation; better illumination, including electric lights in stopes, which permitted more thorough inspection of backs; teaching men where to stand and how to bar down safely; and insistence by bosses that working places be thoroughly barred down.

In operations connected with underground haulage, 146 accidents occurred in 1925 and 8 in 1937. In this operation, improvements in the design of safety doors will undoubtedly prevent many serious and fatal accidents.

In the same manner, accidents occurring in handling rock and ore, including loading at chutes, were reduced from 203 in 1925 to 9 in 1937, and those due to powder smoke and gas from 6 to 0 for the past six years.

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* *Abstract of address delivered before the recent 5th Annual Metal Mining Convention and Exposition, American Mining Congress.*

Quickly, Positively

*Checked*

FOR PROPER FIT...

# the AMERICAN R1000 RESPIRATOR

It takes only a moment to make this safety test: place respirator on face . . . unscrew retainer cup. Then remove cartridge . . . and reverse it so the solid disc is next to facepiece. Replace retainer cup. NOW . . . if correctly positioned on face . . . *wearer cannot inhale.*

This is one of many features of the R1000 Respirator. Every scientific provision has been made for safety, comfort and ease of breathing — *as well as for service economy.* Respirator is lightweight. Filter cartridge is long-lived, compact. Non-toxic rubber face mask fits any face without adjustment, has exclusive cantilever-type edge that maintains comfortable double seal. New-type inhalation valve. Two positive exhalation valves. Read the complete details in Bulletin TL 119. *Write for a copy. Approved for Type A Dusts by U. S. Bureau of Mines.*

## AMERICAN OPTICAL COMPANY

Manufacturers, for more than 100 years, of products to aid and protect vision. Factories at Southbridge, Mass. In Canada, Consolidated Optical Co., Ltd. Branch Offices in all principal industrial centers.

# Why Worry about Dust?

**THE M. S. A. MIDGET IMPINGER**

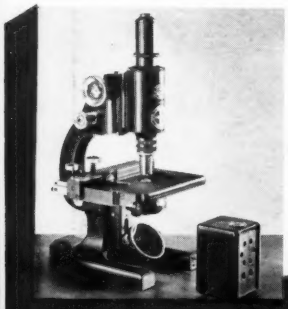
Hand operated, weighs only 9 lbs. complete with 9 Impinger tubes; easy to carry and use on-the-job, requires no electricity or compressed air to operate. Employed by Federal and State Departments, insurance companies, and mining and industrial concerns in every field. Bulletin No. CT-1.

## . . WHEN YOU CAN KNOW YOUR DUST HAZARD

The dust problem looms largest where information regarding it is least! *Knowing* the extent of your own dust hazard means freedom from concern about the "might be's" . . . reducing suppositions to *facts* clears the way to safety.

At low cost and with little effort you can now take the two steps necessary to reliable dust determination in your own plant . . . greatly simplified by M.S.A. First—*collect* samples of the dust contained in the working atmosphere with the low-priced new M.S.A. Midget Impinger; second—*count* the dust particles in the sample, easily accomplished with the M.S.A. Microscope for dust counting, and the M.S.A Microprojector which greatly facilitates the operation of counting.

With these modern M.S.A. Instruments, difficult procedures and complicated apparatus is now a thing of the past in practical dust determination. Let us send you descriptive bulletins, and any special information desired, on the complete M.S.A. Line of air hygiene equipment for the reliable determination of, and protection against, atmospheric contaminants.



**THE M. S. A. DUST-COUNTING MICROSCOPE**

Especially designed for simple operation in counting dust particles. Inexpensive, but precise, with high-grade optics and accurate adjustments. Bulletin No. CT-2.

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**THE M. S. A. MICROPROJECTOR**

Projects the image of dust particles in a sample on a field 20 inches square, with a magnification of 1,000 diameters for counting and 10,000 diameters for particle size measurement.

**MINE SAFETY APPLIANCES COMPANY**

Braddock, Thomas and Meade Streets, Pittsburgh, Pa.

District Representatives in Principal Cities